

Work Order ID 61774

Thursday, September 02, 2010 1:16:56 PM



Page 1

Item ID: D350-748-201

Accept



Setup Start



Revision ID: ✓

Stop



Item Name: Crosstube Installation, High Aft

Start Date: 9/2/2010 Start Qty: 1.00



Cust Item ID:

Required Date: 9/20/2010 Req'd Qty: 1.00



Customer:

Reference:

Approvals: Process Plan: *H*

Date: *10-9-02*

Tooling:

Date:

QC:

Date:

SPC (Y/N):

Date:

Run Start



Stop



Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

Draw Nbr	Revision Nbr
D350-748-241	Rev E

100

0.00



DOCUMENT CONTROL

DC

Memo

0.00

Document Control

Photocopy bluefile & type labels per PPPD350-748-201

CHG01002

per spec 10-504
if new mat'l used

Encl 11-8-23

110

0.00



BENDING MACHINE - CROSSTUBES

CNC Bend 2

Memo

0.00

CNC Alpha 160 Bender

Bend tube as per Dwg D350-748-241 using CNC bender program D350A and Folio FT

DD

11-8-4

120

QC15- Crosstube Dimensional Check

0.00



QC

Memo

0.00

Quality Control

Sil os/as

B61774 D350-748-201

W/O: 61774

WORK ORDER CHANGES

DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: D350-748-201 PAR #: N/A Fault Category: cross-rub NCR: Yes No DQA: A Date: 11.08.29
11779 Resolution: acceptable Disposition: use as-is QA: N/C Closed: ✓ Date: 11/08/29

NCR:

WORK ORDER NON-CONFORMANCE (NCR)

DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			
11.08.08	11b	Bent wide. +0.2" per side from nominal L6 Process	UP 11.08.08 CP1042	Acceptable	N/A	S 11/08/25	UP 11.08.08 CP1042	S 11/08/25

NOTE: Date & initial all entries

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Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Run Start



Stop



Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
125		0.00							
HandFXtube	Memo	0.00							
Hand Finishing Crosstubes	***Stress relief*** Heat treat crosstube as per QSI010 4.3	Temp 375 Start 4h30 Finish 8h30			SAD 11-08-05				
127	QC5- Inspect part completeness to step on W/O	0.00							
QC	Memo	0.00							
Quality Control									

8/10/10

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start



QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop



Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
130		0.00							
	Crosstubes					①			
Crosstubes	Memo	0.00							
Crosstubes	1-Drill Tube as per Dwg D350-748-241 Using DT8876 Drill Jigs, Set-up drill table as per QSI 010								
	2-Deburr								
	3-Engrave Part # and Batch # as per Dwg D350-748-241								
	4-Remove all marks from tube within limits of D350-748-241								
	5- Apply a light coat of LPS3 on the interior of tube Batch: <u>M100956</u>								
140									
	QC6- Inspect dimensions to drawing	0.00							
QC	Memo	0.00							
Quality Control									

SAD 11-08-09

TW 11-08-09

SAD 11-08-10 ①

Sulashio

W/O:		WORK ORDER CHANGES					
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Run Start



QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop



Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
150 Outsource3	Outsource process-Cadplate per QSI017 4.1.9.1	0.00							
Outsource process - Cad plate	<p>Memo</p> <p>Issue P/O: <u>14053</u></p> <p>Stress relief at 375° for 5 hours</p> <p>Magnetic Particle Inspect per ASTM E1444</p> <p>Cadium Plate per AMS-QQ-P-416B, Class 1, Type 2</p> <p>Embrittle relief at 375° for 8 hours, Chromate Treat</p> <p>Possibe Supplier: Southwest United Industries</p> <p>Ensure Certificate of Conformity is attached</p>	0.00							<p>CY 11/08/10</p> <p>①</p>
160 Packaging	Receive & Inspect for Damage & Mat'l Certs	0.00							
Packaging	<p>Memo</p> <p>Ensure certificate of conformity is attached</p>	0.00							<p>CY 11/08/22</p> <p>①</p>
170 QC	QC5- Inspect part completeness to step on W/O	0.00							
Quality Control	<p>Memo</p>	0.00							<p>8/11/08/22</p> <p>④</p>

PTO

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector	
11.08.22	171	GEAR LOADED TO 3000 ^{lb} FOR 1 MINUTE PER ATTACHED D.S. EMAIL	AD	11/08/22	1	CP 11.08.22 CS1042	J 11/08/22	
11.08.22	172	new NDT tube PO 14725 ACUREN NDT 11-08-23	CZ		1	CP 11.08.22 CS1042		

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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Required Date: 9/20/2010 Req'd Qty: 1.00




Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____
QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Run Start

Stop

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
180  SprayPaint	SprayPaint	0.00				W	11	08	24 ①
	Memo	0.00							
	Spray Painting	1-Prime inside crosstube as per QSI 005 4.2 2-Paint Outside of Tube as per Dart QSI 005 4.2							
190  QC	QC14- Inspect Spray Paint	0.00				25	11	08	25
	Memo	0.00							
	Quality Control	Then, Wrap in plastic bag to protect from scratches							
200  Crosstubes	Crosstubes	0.00				W	11	08	25 ①
	Memo	0.00							
	Crosstubes	1-Install Ground wire Insert, then insert screw and washer 2-Install Abrasion strips as per Dwg D350-748-241 & QSI 035. 3-Install supports Using Dt8876 as per Dwg D350-748-241, Torque to 60-80 IN-LBS							

W/O:		WORK ORDER CHANGES					
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Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start



QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop



Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
210 QC Quality Control	QC5- Inspect part completeness to step on W/O Memo	0.00 0.00		5 u/a 9/2/25		④			
220 Packaging Packaging	Pick Kit Memo	0.00 0.00					11/8/25		
230 QC Quality Control	QC4- 100% Inspect kits for completeness Memo	0.00 0.00		8 u/a 9/2/25		④			

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Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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Cust Item ID:

Required Date: 9/20/2010 Req'd Qty: 1.00

Customer:



Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
240		0.00							
	Packaging								
Packaging	Memo	0.00							
Packaging	Identify and pack for shipping as per PPPD350-748-201								
	Location: _____								
	PPP Rev: <u>B</u>								
250		0.00							
	QC21- Final Inspection - Work Order Release								
QC	Memo	0.00							
Quality Control									

11/8/25

11/8/25

ME 11-08-25

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

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Picklist Print

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Page 1

Work Order ID: 61774

Parent Item: D350-748-201

Parent Item Name: Crosstube Installation, High Aft

Start Date: 9/2/2010


Required Date: 9/20/2010

Start Qty: 1.00


Required Qty: 1.00

Comments: IPP Rev: A New Issue 06-07-05 JLM
 IPP Rev: B Update qty of MS21042L5 06-09-12 KJ
 IPP Rev C Combined manufacturing 08.04.02 EC verified by: DD
 IPP Rev:D 08-06-24 revD as per dwg DD verified by:EC
 IPP Rev: E 08.12.11 Step17 was step 21 KJ Verified by:EC IPP Rev:F
 10.08.04 added QSI010 4.3 DD verf:EC

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
---------------------------------	------------------------	---------------	-------------	---------------------	------------------	-----------------	--------------------	----------------	-------------	--------------	---------------	----------------	--------


D350-748-241TRN		Manufactured	No			110	Each	3.0000	1	1			
													
Crosstube Turning Detail													

Location	Loc Qty	Loc Code
LG	3	
59549	1	68834
59551	1	
59587	1	

ALS4-1032-225		Purchased	No			200	Each	5,336.000	1	1			
													
Insert													

13# 111581

Location	Loc Qty	Loc Code
PK011	5336	
110768	5336	

AN960JD10	NAS1149D0363J	Purchased	No			200	Each	6.0000	1	1			
													
Washer													

B# 118077

Location	Loc Qty	Loc Code
ST	6	
107715	6	

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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Work Order ID: 61774

Parent Item: D350-748-201

Parent Item Name: Crosstube Installation, High Aft

Start Date: 9/2/2010

Required Date: 9/20/2010

Start Qty: 1.00

Required Qty: 1.00

D2856-400 Manufactured No

200 f

313.4060 1.181 1.243158



Abraison Strip



M 11. 08-25

B# 71164

Location

Loc Qty

Loc Code

ST403

313.4060421

56626

97.4060421

59920

216

1- cut as per dwg D2856

D3502-1 Manufactured No

200 Each

54.0000 2 2



Support



M 11 08 25

B# 61843 x1

Location

Loc Qty

Loc Code

ST063

12

61206 x1

12

ST066

42

50287

38

52903

4

MS21920-20 Purchased No

200 Each

77.0000 2 2



Clamp (per MIL-DTL-8783C)



M 11 08 25

B# 118236

Location

Loc Qty

Loc Code

LG

77

112624

6

114687

21

114779

24

115057

26

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Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

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Work Order ID: 61774

Parent Item: D350-748-201

Parent Item Name: Crosstube Installation, High Aft

Start Date: 9/2/2010

Required Date: 9/20/2010

Start Qty: 1.00

Required Qty: 1.00

MS27039-1-10

Purchased

No

200

Each

126.0000

1

1



Screw



11/08/25

B# 117441

Location

Loc Qty

Loc Code

ST291

126

112794

26

112940

100

220

Each

274.0000

8

8

AN4-41A

Purchased

No



Bolt



Location

Loc Qty

Loc Code

ST337

40

ST360

234

111424

4

113359

30

114941

100

115108

100

220

Each

1,418.000

16

16

AN4-6A

Purchased

No



Bolt



11/25/4

Location

Loc Qty

Loc Code

ST356

1418

112933

96

113149

19

114523

2

114615

1

114941

500

115108

300

115457

500

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Parent Item Name: Crosstube Installation, High Aft

Start Date: 9/2/2010

Required Date: 9/20/2010

Start Qty: 1.00

Required Qty: 1.00

AN5-32A

Purchased

No

220

Each

196.0000

4

4

Bolt

Location

Loc Qty

Loc Code

ST340

196

113121

4

114056

42

114405

50

115016

50

115108

50

AN960JD416

NAS1149D0463J

Purchased

No

220

Each

0.0000

32

32

Washer

AN960JD516

NAS1149D0563J

Purchased

No

220

Each

34.0000

8

8

Washer

Location

Loc Qty

Loc Code

ST

34

103694

18

107534

12

109287

4

D3500-1

Manufactured

No

220

Each

30.0000

4

4

Saddle

Location

Loc Qty

Loc Code

ST424

30

55605

2

59422

16

60489

12

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Start Date: 9/2/2010

Required Date: 9/20/2010

Start Qty: 1.00

Required Qty: 1.00

D3501-1

Manufactured No

220 Each

394.0000

16 16



Bushing



B677578

Location

Loc Qty

Loc Code

ST066

394

45402

15

45918

112

48268

67

53779

100

61196

100

MS21042L4

Purchased No

220 Each

2,363.000

24 24



Nut



M117005

Location

Loc Qty

Loc Code

ST300

2363

113422

68

114523

28

114718

16

114784

331

115108

1920

MS21042L5

Purchased No

220 Each

633.0000

4 4



Nut



M117441

u/8/25

Location

Loc Qty

Loc Code

ST139

133

114813

133

ST300

500

115156

500

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Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

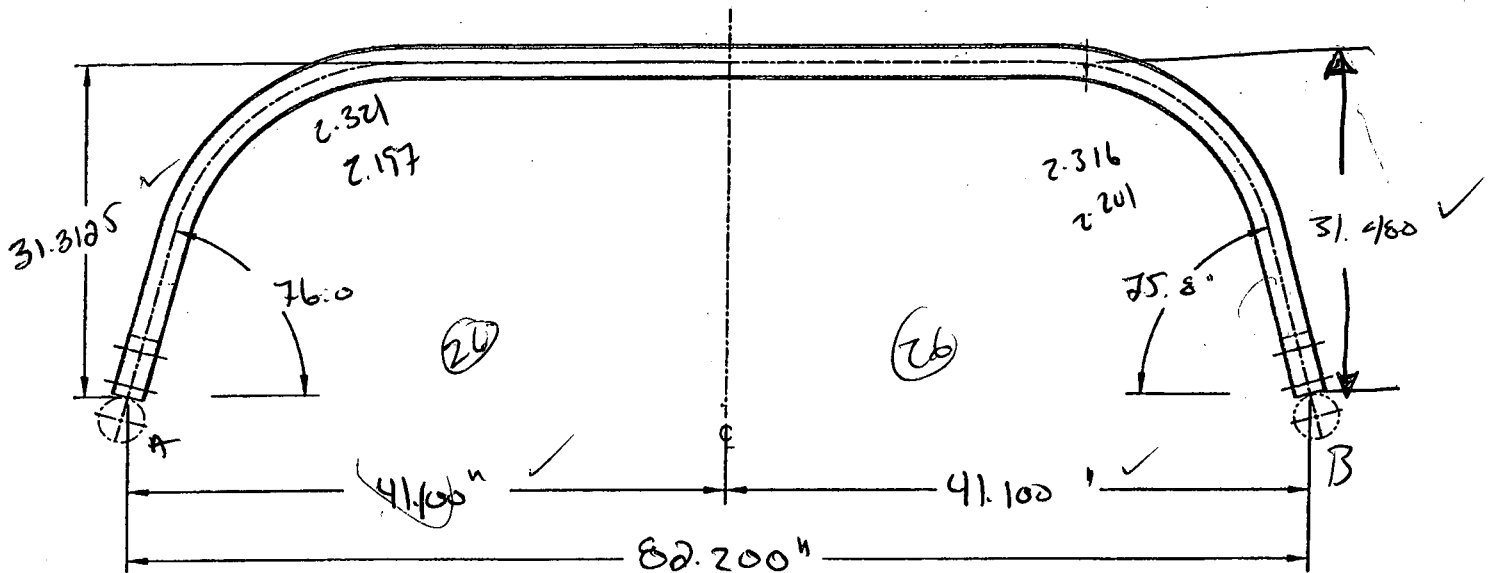
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NOTE: Date & initial all entries

DART AEROSPACE LTD	Work Order:	61774
Description: Crosstube High Aft (AS350/355)	Part Number:	D350-748-201
Inspection Dwg: D350-748-241 Rev: E		Page 1 of 1

Required Dimension	Min	Max
Height	31.22	31.48
1/2 Span	40.77	41.03
Angle	75	77
Total Span	81.54	82.06



Comments
Twist = 0.080"
Side A = 2.37% crushing @ 26 passes
Side B = 2.57% crushing @ 26 passes

But wide
Acceptable

11.08.08

QC15 Inspection	D 11/08/08
Date	

Rev	Date	Change	Revised by	Approved
A	07.02.06	New Issue	KJ/JM	
B	10.08.23	Dwg Rev updated	KJ	

W/O:		WORK ORDER CHANGES					
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NOTE: Date & initial all entries

Item	Qty -241	Part Number	Description
1	X	D350-748-241	CROSSTUBE ASSEMBLY (AS 350/355 HI AFT)
2	1	D6018-125	CROSSTUBE
3	2	D3502-1	SUPPORT
4	2	D2856-400-710	ABRASION STRIP
5	1	AELS-1032-225	INSERT
6	1	NAS1149D0363J	WASHER (OR AN960JD10)
7	2	MS21920-20	CLAMP (PER DART SPEC. M-MS21920-20)
8	1	MS27039-1-10	SCREW

GENERAL NOTES:

- 1) MATERIAL: MANUFACTURED FROM D6018-125
FINISHED LENGTH = 122.700±0.06
- 2) FINISH: MAGNETIC PARTICLE INSPECT PER DART QSI 038 4.2
CADMIUM PLATE PER AMS-QQ-P-416B, CLASS 1, TYPE II
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART QSI 005 4.2
- 3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED.
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- 6) IDENTIFICATION: SCRIBE DART PART NUMBER "D350-748-241" AND BATCH NUMBER ON INSIDE OF CUFF USING VIBRATING STYLUS.
- 7) WEIGHT: 29.85 lbs
- 8) PART IS SYMMETRIC ABOUT CENTERLINE, EXCEPT FOR Ø0.297 HOLE.
- 9) RUN CUTTER OFF PART WHERE INDICATED. BLEND OUT ALL EDGES FROM MACHINING LONGITUDINALLY, TRANSITION SHOULD BE SMOOTH. NOTE: ALL HOLES ARE DRILLED AFTER BENDING.
- 10) BEND PROGRESSIVELY WITH A MINIMUM OF 7 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D.
- 11) HEAT TREAT TO MIN. 180 KSI PER MIL-T-6736 OR AMS 2759-1C AFTER TURNING.
- 12) INSTALL D2856-400-710 ABRASION STRIPS WITH A GAP ON BOTTOM SIDE OF CROSSTUBE, CENTERED OPPOSITE D3502-1 SUPPORT, PER QSI 035.
- 13) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE. WHEN DRILLING HOLES EXTREME CARE MUST BE TAKEN AND CAREFUL DEBURRING PERFORMED TO ENSURE A CLEAN HOLE WITH NO CRACKING/CHIPPING/GROOVES.
- 14) TORQUE CLAMPS 60 TO 80 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

SHOP COPY
RETURN TO
ENGINEERING
UNCONTROLLED COPY
SUBJECT TO AMENDMENT
WITHOUT NOTICE
WORK ORDER
NO. 61774
2810-9-02

RELEASED
2009-10-29

E	REVISE GENERAL NOTES; UPDATE TO CURRENT STANDARDS; RELOCATED FLAG #6 PER PAR 08-046 (ZN A8-3); ADD TOLERANCES (ZN C6-3, D2-3)	RF	09.09.30
D	MAG. PARTICLE AND CAD PLATE AS MFD.	CP	06.10.31
C	ADD CAD PLATING	CP	06.08.14
B	ADD D6018-125 & PRIME AND PAINT	CP	06.06.30
A	NEW ISSUE	CP	06.03.31
REV.	DESCRIPTION	BY	DATE
DESIGN	<u>98</u>	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWN	RF		
CHECKED	<u>98</u>	DRAWING NO.	REV. E
MFG. APPR.	<u>98</u>	D350-748-241	SHEET 1 OF 4
APPROVED	<u>98</u>	TITLE	SCALE
DE APPR.	<u>98</u>	CROSSTUBE (AS 350/355 HI AFT)	NTS
DATE	09.09.30	COPYRIGHT © 2006 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	

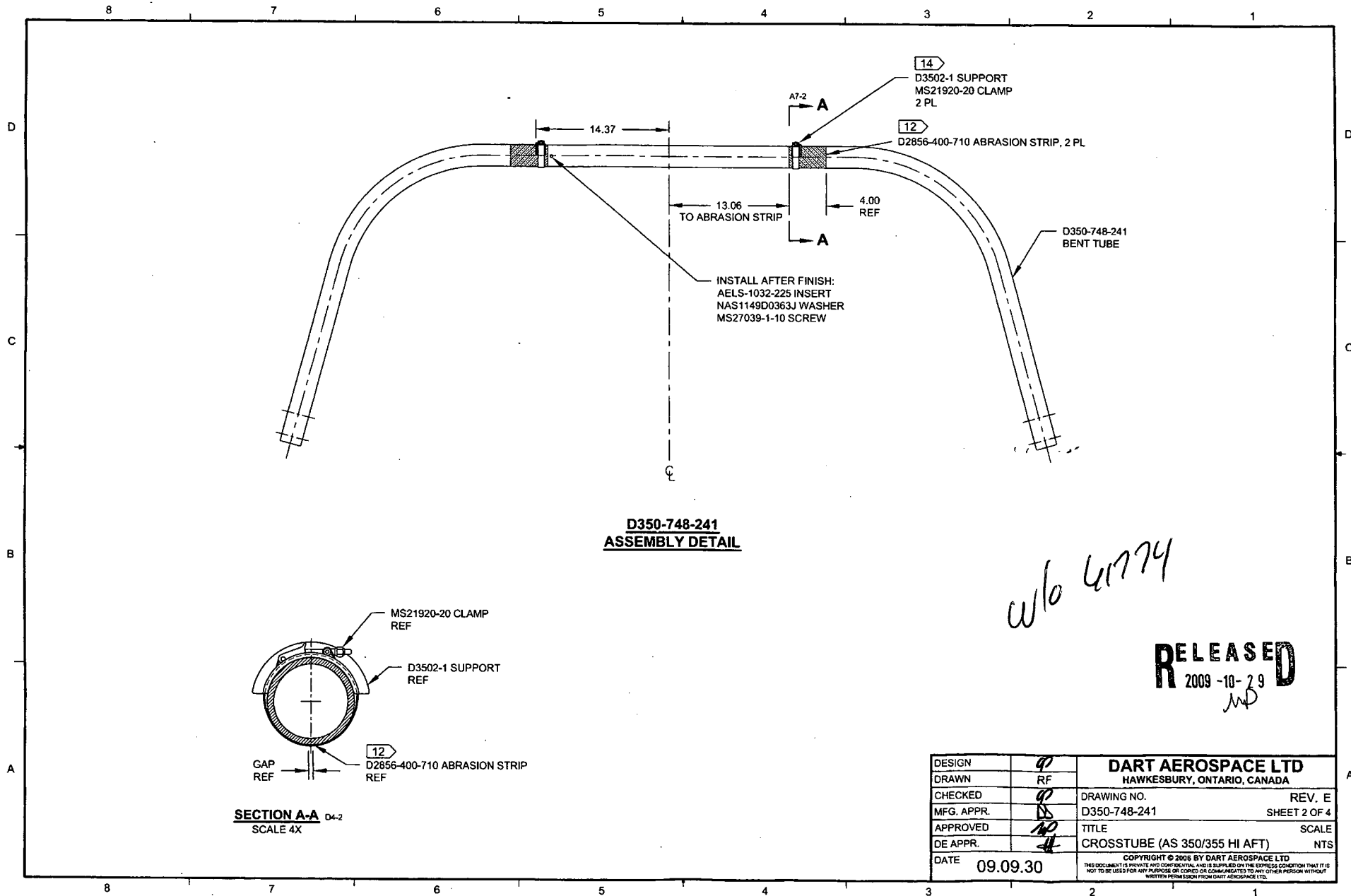
W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries



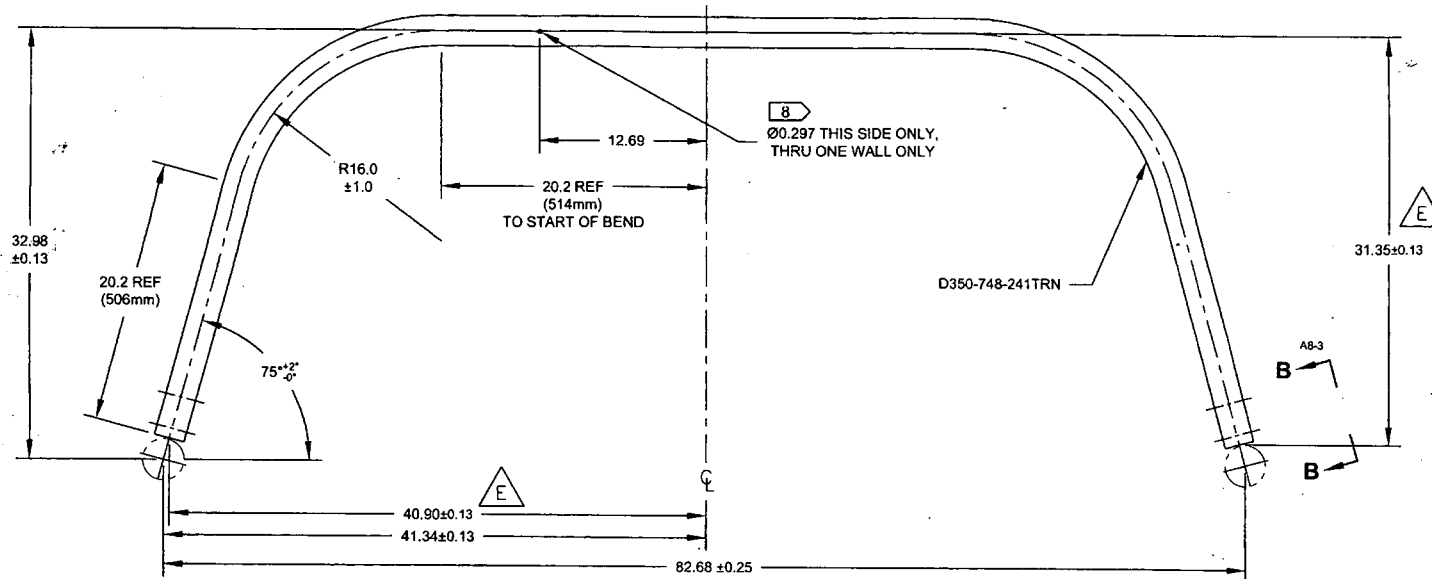
W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

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			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

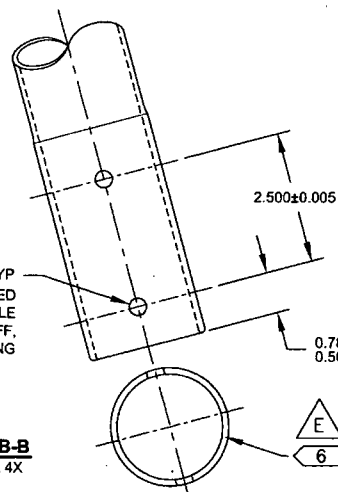
NOTE: Date & initial all entries



D350-748-241
BENDING AND DRILLING DETAIL 10

Ø0.323^{+0.005}_{-0.000} THRU, TYP
HOLE TO BE ALIGNED
WITHIN ±0.001 OF HOLE
ON OTHER SIDE OF CUFF,
TO BE DRILLED AFTER BENDING

C2-3 **VIEW B-B**
SCALE 4X



W/O 61774

RELEASED
2009-10-29

DESIGN	RF	DART AEROSPACE LTD	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	RF	DRAWING NO.	REV. E
MFG. APPR.	RF	D350-748-241	SHEET 3 OF 4
APPROVED	RF	TITLE	SCALE
DE APPR.	RF	CROSSTUBE (AS 350/355 HI AFT)	NTS
DATE	09.09.30	COPYRIGHT © 2006 BY DART AEROSPACE LTD	
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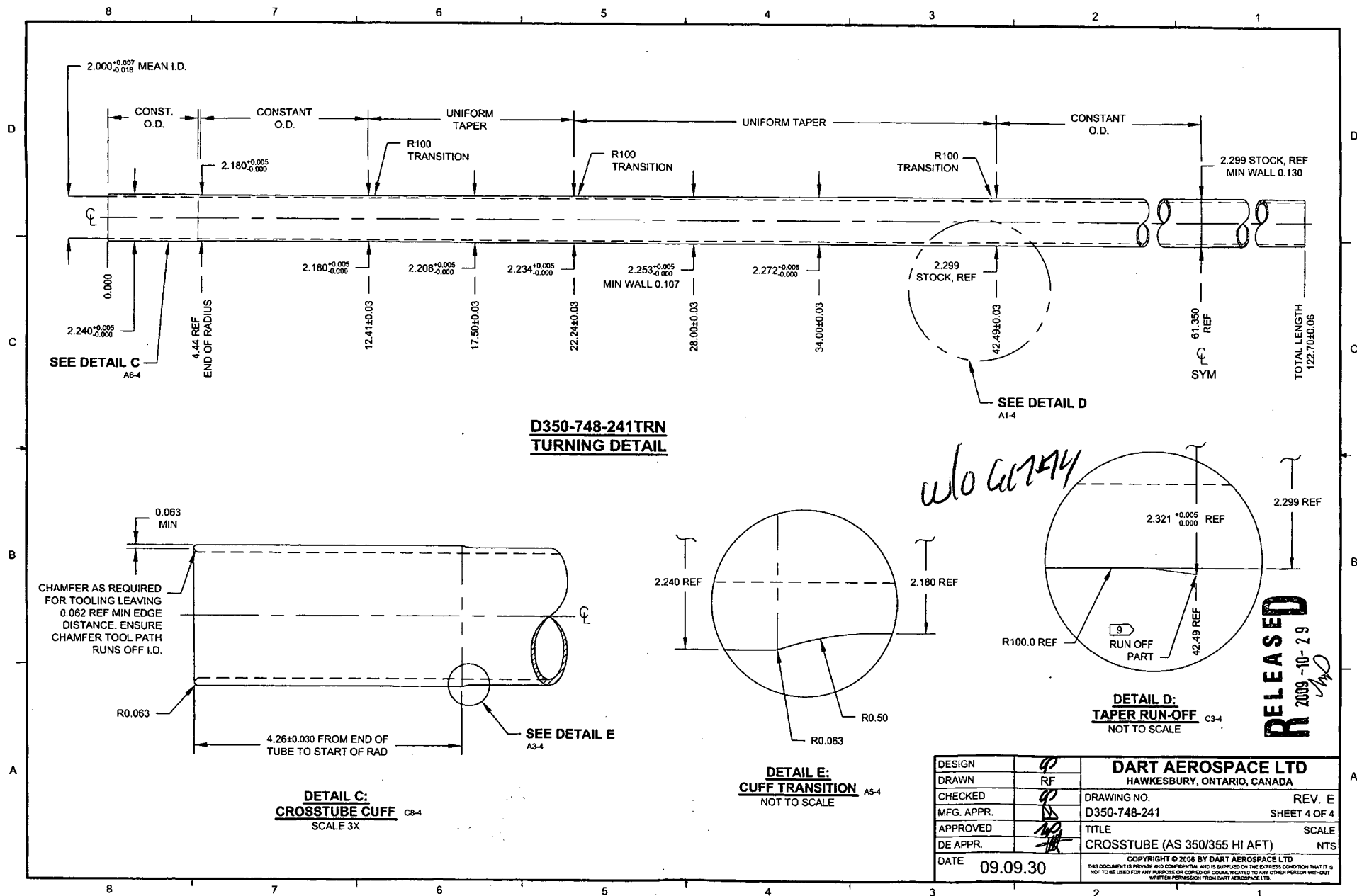
W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries



W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

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			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Packing Slip



Cadorath Coating

2150 Logan Avenue, Winnipeg, Manitoba R2R-0J2

Phone: (204) 633-9420 Fax: (204) 633-8033

INVOICE NUMBER:

56257

Sold To:

Dart Aerospace Ltd.
1270 Aberdeen St.

Hawksbury, ON K6A 1K7

ShipTo:

Net 2% Interest Per Month charged on Overdue Accounts.
Any claims for shortages, overcharges, or damaged goods must
be made within seven (7) days from receipt of goods.

Customer Order #: 14653

Date Received: Aug-15-2011

Terms:

NET 30 DAYS

G.S.T. #:

10071 6547 RT0001

Ship Via:

Ship Date:

Aug-19-2011

Item # Qty P/N & Description

1	1 EA	SKID	S/N B68519	✓
		P/N d350-748-101	W/O 106856	
2	1 EA	SKID	S/N B72502	✓
		P/N d350-748-101	W/O 106857	
3	1 EA	SKID	S/N B61773	—
		P/N D350-748-201	W/O 106858	
4	1 EA	SKID	S/N B61774	—
		P/N D350-748-201	W/O 106859	

C L 11/08/22

Chris Provencal

From: David Shepherd <dshepherd@dartaero.com>
Sent: Tuesday, April 27, 2010 3:40 PM
To: 'Mike Petsche'
Cc: 'Bill Beckett'; 'L Lacelle'; 'Chris Provencal'; 'Dan Stow'; ssheldon@dartaero.com
Subject: 350 crosstubes

Mike,

I discussed the 350 crosstube load testing with Bill a little while ago and this plan makes sense to him.

So, my recommendation to clear these crosstubes is to load the fwd crosstubes to 3500 lb and the aft crosstubes to 3000 lb in the deflection test rig and document on the work orders that this test has been completed. Hold max load for 1 minute. Per TP-D350-748-2, these loads represent the maximum load on these crosstubes at gross weight and are below the yield point of the material. I would like to request that Chris Provencal witness these tests and sign off the work orders based on his experience with Dart landing gears. My feeling is that if there is a problem with the parts, it will manifest itself during this load test. I, for one, would feel a lot more confident in testing each crosstube in this manner than relying totally on what Exova has to say. I think it would be very difficult to reach a conclusion on the whole batch on the basis of cracks in two parts from the batch.

I believe that we can accomplish this before next Friday, which also gives us time to hear what Exova has to say in case it has an impact on our decision. So far, what I have seen from Exova shows me that there are fluctuations in the heat treating but the tubes are heat treated to our specification.

For this reason, I believe we should tell DHS that it looks like we will be able to start shipping 350 crosstubes by May 7th pending a successful Engineering test of the material.

David.

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries



LIQUID PENETRANT TEST REPORT

P- 05628

CLIENT

ATTENTION

ADDRESS

PROJECT

ITEM(S) EXAMINED

DATE

ACUREN JOB NO.

PO/VO NO.

WORK LOCATION

ACCEPTANCE STD.

PAGE

OF

TIME

AM

PM

DART AEROSPACE
LYNDA / CHASTALE / IAN / MATTAug/23/2011
18811-02167

HAWKE BURY, ON

AS ADDRESS

ASTM 417/418-03

REV./DATE 2005

PT WET FLUORESCENT ON 4 CROSSTUBES

- SEE BELOW

JOB DESCRIPTION

PROCEDURE NO. LT-002 REV./DATE 2008

TECHNIQUE NO. LT-003

REV./DATE 2008

ART NO.

COPE

STEEL + CADMIUM PLATING MATERIAL ~~ALUMINUM~~ THICKNESS N/A
PERFORMED A WET FLUORESCENT L.P. INSPECTION ON 100% OF THE EXTERNAL SURFACE ON ITEMS MENTIONED BELOW

TEST DETAILS

METHOD	<input checked="" type="checkbox"/> FLUORESCENT	<input type="checkbox"/> VISIBLE	<input checked="" type="checkbox"/> WATER WASH	<input type="checkbox"/> SOLVENT REMOVABLE	<input type="checkbox"/> POST EMULSIFIED
AMLY BRAND	MAGNA FLUX		BLACK LIGHT S/N	13798	<input type="checkbox"/> OUTPUT > 1000 μ W/cm ²
ENETRANT	2L-67	MINIMUM DWELL TIME 10 MIN.	LIGHTING EQUIP.	<input type="checkbox"/> FLASHLIGHT	<input type="checkbox"/> TROUBLELIGHT
ENETRANT REMOVER	H ₂ O	MINIMUM DRY TIME >10 MIN.	OTHER		
EVELOPER	SKD-52	MINIMUM DWELL TIME 10 MIN.	LIGHT METER S/N	CAL DUE DATE Aug/2012	
EVELOPER TYPE	<input checked="" type="checkbox"/> NON AQUEOUS	<input type="checkbox"/> AQUEOUS	<input type="checkbox"/> DRY		

TEST SURFACE

SURFACE CONDITION	<input type="checkbox"/> AS GROUND	<input type="checkbox"/> AS WELDED	<input type="checkbox"/> MACHINED	<input type="checkbox"/> SHOT BLASTED	<input checked="" type="checkbox"/> CLEAN BARE METAL
SURFACE TEMPERATURE	<input type="checkbox"/> < -4°C/ 20°F	<input type="checkbox"/> -4°C/ 20°F TO 10°C/50°F	<input checked="" type="checkbox"/> 10°C/50°F TO 52°C/125°F	<input type="checkbox"/> > 52°C/125°F	

RESULTS-

(☐ METRIC ☐ IMPERIAL)

1	CROSSTUBE	W.O. ID 61773
2	"	W.O. ID 61774
3	"	W.O. ID 68519
4	"	W.O. ID 72303

ITEM ID	D 350-748-201	AFT
ITEM ID	D 350-748-201	AFT
ITEM ID	D 350-748-101	FWD
ITEM ID	D 350-748-101	FWD

NO RELEVANT INDICATION WAS DETECTED
AS PER APPLICABLE STANDARDS

NOTE: MTL: STEEL + CADMIUM PLATING

Scope of Services

The agreement of Acuren Group Inc. to perform services extends only to those services provided for in writing. Under no circumstances shall such services extend beyond the performance of the requested services. It is expressly understood that all descriptions, comments and expressions of opinion reflect the opinions or observations of Acuren Group Inc. based on information and assumptions supplied by the owner/operator and are not intended nor can they be construed as representations or warranties. Acuren Group Inc. is not assuming any responsibilities of the owner/operator and the owner/operator retains complete responsibility for the engineering, manufacture, repair and use decisions as a result of the data or other information provided by Acuren Group Inc. In no event shall Acuren Group Inc.'s liability in respect of the services referred to herein exceed the amount paid for such services.

Standard of Care

When performing the services provided, Acuren Group Inc. uses the degree, care and skill ordinarily exercised under similar circumstances by others performing such services in the same or similar locality. No other warranty, expressed or implied, is made or intended by Acuren Group Inc.

SIGNATURES

CLIENT REPRESENTATIVE

TECHNICIAN (SIGNATURE):

NAME (PRINT):

Ian Titley

PRINT

[Signature]

SIGNATURE

J. VESDESLOER

1ST TECHNICIAN

CGSB LEVEL

CGSB REG. No

SNT LEVEL 2

2049

CGSB LEVEL

CGSB REG. No

2ND TECHNICIAN

SNT LEVEL

DTR # E44712

REPORT

REVIEWED BY:

NAME

INITIALS

WHITE - CLIENT COPY

CANARY - OFFICE COPY

PINK - TECHNICIAN COPY

GOLD - OFFICE COPY

PT Sept 2005

32.7 WEIGHT AND BALANCE

The following weight and balance information is for Dart crosstube installations only. This data should be similar to the existing installation. Differences from the parts removed are the responsibility of the installer.

DART CROSSTUBE	FWD/ AFT	WEIGHT	STA	MOMENT
D350-748-101	Fwd	35.2 lb (16.0 kg)	106.3 in (2.70 m)	3742 lb-in (43.2 kg-m)
D350-748-201	Aft	34.7 lb (15.7 kg)	162.4 in (4.12 m)	5635 lb-in (64.7 kg-m)

32.8 PARTS LIST

Qty -101	Qty -201	Part Number	Description
X		D350-748-101	CROSSTUBE INSTALLATION, AS 350/355 HIGH FWD
	X	D350-748-201	CROSSTUBE INSTALLATION, AS 350/355 HIGH AFT
1		D350-748-141	CROSSTUBE ASSEMBLY, AS 350/355 HIGH FWD
	1	D350-748-241	CROSSTUBE ASSEMBLY, AS 350/355 HIGH AFT
*2	*2	D3502-1	SUPPORT
*2	*2	D2856-400-710	ABRASION STRIP
*1	*1	AELS-1032-225	INSERT
*2	*2	MS21920-20	CLAMP
*1	*1	MS27039-1-10	SCREW
*1	*1	AN960JD10	WASHER
4	4	D3500-1	SADDLE
16	16	D3501-1	BUSHING
16	16	AN4-6A	BOLT
8	8	AN4-41A	BOLT
4	4	AN5-32A	BOLT
32	32	AN960JD416	WASHER
8	8	AN960JD516	WASHER
24	24	MS21042L4	NUT (OR MS21042-4)
4	4	MS21042L5	NUT (OR MS21042-5)

* REFERENCE ONLY. PARTS ARE INCLUDED IN D350-748-141/241 ASSEMBLIES ABOVE